

SHORT-TERM AND LONG-TERM POLICY OPTIONS

ALL CLIMATE IMPACTS OF CONCERN TO POLICY-MAKERS ARE LOCAL

A common expression suggests "all politics are local"; a similar statement could be made for political concern about the impacts of global warming. As suggested earlier, global average statistics about global warming's influence on temperature and on the hydrologic cycle are not particularly useful for policy makers at the national to local levels. Thus, climate change concerns eventually center on what the impacts might be at various sub-national levels.

A search on the Internet using the phrase "What will be the manifestations of climate change?" yields many articles suggesting the possible impacts in different countries (and regions within countries) of global warming of a couple of degrees Fahrenheit. For example, one UK report notes the following:

The ways in which climate change manifests itself will vary dramatically from region to region in the UK, according to the experts. City centres will become hotter, changes in agricultural practices will alter the rural landscape beyond recognition and some coastal areas could find themselves completely submerged – a major concern for the economy, as half of Britain's prime agricultural land is below the five-metre contour.

Many of Britain's large industrial plants – from oil refineries to nuclear power stations – are also concentrated on the coastline, and may have to be moved or defended in the face of rising sea levels. Some of the country's largest landfill sites are situated on former coastal marshes, which could spell environmental disaster in the event they become swamped.

Droughts are expected to increase in the south, especially in the summer. The north and west are more likely to suffer from abundant and intense rainfall.

The combination of sea level rise with high tides and changes in winds means severe flooding – the likes of which has plunged much of Britain under water in recent weeks – will become a regular threat. [<http://news.uk.msn.com/How-climate-change-will-affect-regions-in-the-UK.aspx>]

When considering how climate change is going to affect the UK, it's useful to understand the risks that current climate already poses to individuals, landscapes, organizations and the economy, before moving on to explore future climate risks. This report provides a valuable source of information to support this first step, stimulating better understanding of how the UK's climate affects our everyday lives (http://www.ukcip.org.uk/images/stories/08_pdfs/Trends.pdf)

Korean government agencies are also identifying potential impacts of global warming that will affect their peninsula:

Q. How will global warming manifest itself on the Korean peninsula?

A: When the temperature rises, torrential rain becomes more frequent and the sea level rises. The temperature of the sea will go up. When the rise reaches 2-3 degrees, 20-30 percent of existing species will become extinct. The species of fish caught in the sea will change and a lot of jellyfish will appear. Fruit growing regions will also change, as seen in the way apples are now grown in Yanggu, Gangwon Province.

A developing country example was provided when, in December 2007, government and other officials met in Kinshasa, Democratic Republic of the Congo to discuss the possible impacts of global warming on activities in the DRC. The UNDP DRC director stated his concern about climate change in the following way: “What is climate change in the DRC? How does it manifest itself, and how can we, civil society, politicians and the international community, come together to plan and find a solution?” (<http://allafrica.com/stories/printable/200712210975.html>).

Yet another example of concern was provided in a PowerPoint format by a Caribbean climate change project, PRECIS-Caribbean (<http://precis.insmet.cu/eng/Precis-Caribe.htm>):

How will climate change manifest itself in the region?

Will a future Caribbean climate be:

- *Hotter/Cooler?*

- *Wetter/Drier?*

Important (we feel) if we are to address vulnerability and adaptation.

The point of using these disparate geographic examples in which the same question – “How will global warming (or climate change) manifest itself” in my region? – is posed to support the contention that locales worldwide are already engaging in self-appraisals about what they might expect with an even warmer atmosphere, having unknowingly been coping with a changing climate during the past few decades.

WORKING WITH CHANGE, NOT AGAINST IT

The phrase “climate change” raises eyebrows and interest now as never before. The word “change” is responsible for this awareness. Most people, institutions and governments fear change that they do not control, which should be remembered in discussions about climate change.

In the mid twentieth century, Eric Hoffer, an American migratory worker and self-taught social philosopher, wrote a book entitled *The Ordeal of Change* in which he discussed how people fear even the smallest changes to their routine or way of life (Hoffer, 1963). He wrote about the fear he faced as a migrant worker in California during severe multi-year droughts in the United States. He had finished picking peas on one farm and was about to move to pick beans next on a different farm, but he was afraid he would not be able to pick beans. Most people today might not see this shift in work as an insurmountable change, but it was to him. Today with a changing global climate, the fear is mounting in civil society and among its representatives of a new kind of unprecedented change that will have more serious implications for societies and their citizens. How will members of society feel when their lives are forced to change because of a warming climate?

Change can take place in many ways: it can be an abrupt, step-like change or a long, drawn-out affair. An abrupt change is clearly a crisis for a society. Some scientific reports warn of abrupt climate changes occurring in relatively short time periods (on a scale of decades), if one or another tipping point in the

global climate regime is reached. Unfortunately, scientists and decision makers do not have adequate local to national reliable, detailed information about the possible impacts to take immediate actions to minimize potential damage. Again, this is yet another reason that resilient adaptation provides a level of flexibility necessary for an effective response to future climate uncertainties.

For slow-onset changes, different problems arise. First of all, they are preventable and reversible up to a level of degradation. Second, the consideration that incremental changes would eventually lead to major environmental changes, if not full-blown crises that demand concentrated attention and require a large amount of funds to address, seems difficult for policy-makers to accept. Third, and most important, is the fact that governments do not have a good track record of dealing with creeping, incremental but cumulative changes in the environment, at least not until those changes have reached the stage of environmental crisis. Rates of change in greenhouse gas emissions, in local temperature and precipitation, in ecosystem functioning, and in demographics are extremely important to monitor for identifying impacts and response strategies in a timely way and then prioritizing them.

The point is that climate-related change will not directly affect all people within a given region or country at the same time or in the same way. In the near future, policy-makers will have to convey this idea to local people and their leaders, but first researchers from various fields will have to determine effective ways to convey this notion to policy practitioners (Box 3).

APPROACHING ADAPTATION AND MITIGATION PLANNING WITH EYES WIDE OPEN

Adaptation to climate change has been a serious research topic for about three decades, even though widespread government interest was recently sharply elevated to new heights with the issuance of the IPCC 4th Assessment, the widespread viewing of Al Gore's *An Inconvenient Truth* (Al Gore, 2006), and the awarding of the Nobel Prize to both Gore and the IPCC process. With human-induced warming of the Earth's atmosphere, awareness and interest alone will not be enough, however, as known hazards are likely to take on continually new characteristics, becoming, for example, more intense, more frequent, and perhaps occurring in new locations within a country – or possibly, with some luck, even disappearing from a country or region altogether.

BOX 3

EDUCATION

Education refers to informing policy-makers about what they need to know about baseline conditions. This is viewed as a prior question that should be dealt with before making policy.

- National policy-makers need country-specific information, much of which is already available but may not be available to them in a central location and in readily usable form.
- Governments and individuals alike must remain alert to subtle changes in the environment and to the dynamics of the invisible boundary line at the human interface with climate-sensitive ecosystems.
- Governments must pay more attention to coping with slow-onset, low-grade (creeping) changes in climate, water and weather.
- Government officials would benefit from being reminded of *The Four Laws of Ecology* to warn them about the limits of tampering with natural processes.
- SWOC/T (Strengths, Weaknesses, Opportunities, and Constraints/Threats) assessments are useful tools for identifying and responding to a country's SWOC/T.
- Developing an initial set of strategies and tactics for coping with climate change impacts on food security is only the beginning step of an ongoing process.
- Existing "best practices" should be viewed as tools to provide tactical responses (short-term) to a changing environment.
- Policy-makers must reduce a society's fear of change because climate has always and will continue to change, and society has and must continue to adapt.
- Collaborative and strategic partnerships, domestic and international, can strengthen food security in face of an uncertain future (i.e. disaster-avoidance diplomacy).
- Beware of science-related "fads" for adaptation to or mitigation of global warming. Evaluate before you invest in new adaptation schemes.

Researchers and policy-makers concerned about global warming have focused on one or another aspect of its potential impacts, especially those concerning aspects of fisheries adaptation, urban adaptation, coastal adaptation, agricultural adaptation, health adaptation, public safety adaptation, aquaculture adaptation, tourism adaptation and arid lands adaptation, among many others. Adaptation discussions also focus on specific ecosystems, such as coral reefs, mangroves, tropical rainforests, Polar Regions, mountains, rivers, lakes and marine ecosystems, and so forth. For its part, UNDP's Global Environment Facility (GEF) has noted that its funding would focus on particularly vulnerable regions, sectors, geographic areas, ecosystems and communities.

A different approach to identifying and categorizing adaptation practices could involve placing specific information about adaptation into one or more of the following categories: Adaptation science, adaptation impacts, adaptation policy & law, adaptation politics, adaptation economics, adaptation technology, and adaptation ethics & equity. Yet another approach would be to list the known hazards to a country or region (super- or sub-national) and evaluate the effectiveness of the government's responses to occurrences in the recent past. Such a strategy is intimated in a Chinese proverb: "To know the road ahead, ask those coming back." This strategy would involve identifying the strengths and weaknesses of a society's response mechanisms, and would be a positive action to identify constraints and weaknesses, which could, in turn, help to identify strengths and opportunities that exist or could be developed to overcome them. In addition to a country's recent history of coping with its climate-related and other hazards there is also the possibility of learning about successful mitigation and adaptation policies and practices from other regions and countries that have had to face similar climate-, water- or weather-related hazards.

Clearly, many approaches are possible in developing reliable and effective action plans for mitigation and adaptation to a changing climate. The point is that, though some may prove more effective than others, governments can pro-actively pursue any of these different approaches to protect their societies and economies against these changes' impacts. Because each approach will likely have significant overlap with others, governments will need to determine how best to identify, develop and pursue adaptive strategies and tactics that are best suited to their specific situations and needs.

The 3rd Law of Ecology, that “Nature knows best,” forces decision makers to take a closer look at the recent history of the interactions of food security, food insecurity and climate (variability, fluctuations, extremes and change). Many examples from history can be cited where people believed that they were able to dominate nature and grow what they wanted wherever they chose to grow it with little regard for the long-term stability of the environments they chose to exploit, only to discover the reality of humanity’s vulnerability to the whims of the environment. The Soviet Union’s “Virgin Lands Scheme” of the 1960s and 1970s is an example of a failed attempt to dominate nature. The diversion of the two rivers that feed the Aral Sea in Central Asia, thereby depriving the sea of its water supply, is another example of a failed attempt to dominate nature. The river diversions have led to the near-disappearance of what was once the world’s fourth largest inland sea and to a grave deprivation, both in terms of health and livelihoods, for those who once relied upon it for their sound existence. Yet another example is mangrove destruction in order to create shrimp farms in areas around the world. Unfortunately, many similar examples could be cited because individuals and societies have for too long not respected the limits to which nature can be transformed without harming it.

ADAPTATION AND MITIGATION STRATEGIES AS OUTPUTS

Adaptation and mitigation strategies as outputs refers to the specific reports, conferences and workshops designed to produce policies that are to be pursued to minimize, if not avert, the adverse impacts of global warming on society and on ecosystems. One challenge is to identify suitable indicators to define success and/or limitations of adaptation and mitigation caused by the interdependencies as well as controversies and conflicts that either presently exist or might arise with other sectors’ responsibilities under global warming scenarios.

The first concern of a government should be the safety and well-being of its citizens; the second should be its territorial integrity and protection of infrastructure. Policy-makers have often relied on experts within and outside of government to help identify effective strategic responses to climate variability and extremes in executing these primary and secondary mandates, and now they must do the same for climate change. Reports and other written resources describing these plans are outputs, which are readily

quantified; whether the actions outlined in these outputs will prove effective in practice must be tested by both nature and human activities.

The Australian government has provided a brief set of actions that should be considered when establishing adaptive policies for climate change (Australian Greenhouse Office, 2007). The steps in adaptation are as follows: plan early, be systematic and strategic, use the best information, and be flexible. (<http://www.greenhouse.gov.au/impacts/howtoadapt/index.html>). Similarly, the Danish government has identified a sampling of possible adaptation options that it sees as linked to poverty reduction and economic development:

- Protect against sea-level rise, including salt-water intrusion into water supplies.
- Strengthen primary health care in preparation for the potential spread of vector-borne diseases. Change building codes to withstand extreme weather events, rehabilitation of natural ecosystem such as mangroves to reduce the impacts of storm surges. Redesign infrastructure in regions expected to become wetter with climate change.
- Develop new crops, cropping strategies and insurance schemes.
- Manage water resources for sustainable supplies.

The Danish government believes these adaptations to climate change will be effective and are necessary to manage climate, water and weather-related risk.

Outputs relate to the measure of success of a decision making process. Agreements can be reached, laws can be made, and Plans of Action can be agreed upon; indeed, these are the instruments through which the success of outputs are typically measured. The successes of the decision making process to some extent depend on the motivation, ways and means through which climate change adaptation and mitigation strategies are provided to the policy makers. A priority list of “illustrations” for policy makers relates to adaptation and mitigation of climate change impacts on food security is given in the Box 4.

ADAPTATION AND MITIGATION STRATEGIES AS OUTCOMES

Outcomes measure the effectiveness of the outputs of a decision making process. Laws can be passed by legislatures, for instance, but if no provisions provide for enforcement of or compliance with those laws, the likelihood of favorable outcomes is diminished. Societies hope to cope effectively with extreme climate, water and weather related events, which means that they

BOX 4

ILLUSTRATIONS

Illustrations refer to the ways that information can be exposed to policymakers. Examples of successful adaptations to change that have taken place can be into this category. It is also where successful mitigation activities that have been put carried out can be highlighted. It is also a place for example of mistakes in the incorrect or non-use of climate-related information.

- “Mapping” resiliency in a country in addition to “mapping” vulnerability is useful and important; they are not in opposition to one another.
- Rates of change need to be monitored because they are as important as processes of change when it comes to strategic planning for adaptation and mitigation.
- The future environmental impacts of new land uses can actually be identified, since those impacts have likely occurred elsewhere on the globe. Research focused on finding those places should be supported.
- A SWOC/T assessment can also be valuable to minimize the chance of mal-adaptation.
- Invest in ways to improve scientist-to-policymaker communications to improve understanding of scientific findings related to food security.
- List known hazards to a country or a region and evaluate the level of effectiveness of previous governmental (and societal) responses to recent extreme events.
- Identify suitable indicators to define successes and limitations of adaptation and mitigation caused by interdependencies and controversies/conflicts that either presently exist or might arise through other sectors’ responsibilities under global warming.
- Tradeoffs must be made explicit to policymakers for proposed adaptation and mitigation strategies and tactics.
- The FAO can provide support for undertaking national baseline assessments for greenhouse gas emissions from agriculture-related activities.

BOX 5

RECOMMENDATIONS

Recommendations refer to actual suggestions for policy-driven strategic thinking and action for mitigation and adaptation to climate change related to food security and biofuels.

- Policymakers must introduce and foster the notion of “resilient adaptation” throughout their ministries and agencies as well as in civil society.
- Policymakers must require researchers as well as their own agencies to identify and focus on the protection of Areas of Concern (AOCs) to stop an environmental degradation from becoming a hotspot that will adversely affect food security, forestry and fisheries.
- Explicitly acknowledge agriculture-related controversies and conflicts and then put them into the context of global warming to generate cooperation. Otherwise, proponents will continue see themselves as locked in an apparent zero-sum game with one side winning at the expense of all others.
- Refrain from identifying winners and losers of climate change until objective measures of what it means to win or lose have been identified.
- Keep in mind the Precautionary Principle. In other words, do not use scientific uncertainty as an excuse to avoid decision making when using climate change scenarios for making strategic planning.
- Given the limited funds available, most governments will need to prioritize their adaptive capacity building to climate change impacts and then undertake “adaptation in parts.”
- Additional assessments are needed to discover second-order (downstream) impacts of adaptation and mitigation strategies and tactics.
- Call for and support an assessment that identifies both the obvious and the hidden reasons why hazard-and disaster-related lessons are identified after each disaster but are often not applied (used).

- Require that all new projects affecting the environment, including forestry and fisheries, include a “Food Security Impact Assessment” (FSIA).
- Policymakers must be made aware of the importance of changes in seasonality and must consider this a high priority concern about climate change, since people and economies are align with the expected natural flow of the seasons.
- Consider prevention along with mitigation and adaptation because new activities that are known to produce greenhouse gas emissions can be blocked.
- Policymakers must harmonize the activities of their ministries, agencies and bureaucratic units with the rules used to govern administrative jurisdictions.

want to emerge after an extreme event in the same or better condition as they were in before the onset of the extreme event. In the absence of perfect information in the form of a reliable early warning, for example, costly adverse impacts can be expected. Outcomes are more difficult to measure than outputs, though, interestingly, they are a direct consequence of the level of effectiveness and efficiency of adaptive strategies and tactics.

Issues surrounding adaptive strategies are related both to reducing vulnerability and to increasing societal resilience; importantly, however, reducing vulnerability does not necessarily increase resilience, and increasing resilience does not necessarily reduce vulnerability. In other words, these concepts are not opposite sides of the same coin. The optimal outcome of an effective strategic response to climate change would be a lowered level of vulnerability in regard to food security and a higher level of resilience in the face of climate change’s potential impacts. Perhaps “resilient adaptation,” a notion borrowed from psychotherapy, defines the optimal outcome. A set of comments on recommendations for policy-makers (Box 5) relates to climate change adaptation and mitigation. The comments on recommendations are not mutually exclusive with previous categories of education and illustration.



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A TRADITIONAL BAMBOO WATER MILL IN VIET NAM

Traditional strategies had evolved long before recorded history for coping both with climate variability as well as climate extremes.

LESSONS LEARNED ABOUT “LESSONS LEARNED”:

Lessons identified from climate, water and weather impacts are NOT to be considered as lessons learned. They are only lessons that have been identified for attention, until they have been addressed. Just about every hazard or disaster related assessment ends with a list of lessons learned and recommendations for the future (Glantz, 2000); however, the phrase “lessons learned,” has become part of the problem of addressing issues related to early warnings and coping with future hazards.

The phrase “lessons learned” suggests that someone (we do not know exactly who this person is) is ensuring that a problem identified from a past experience will not happen again (at least in terms of severity of impacts). Once lessons have been identified and publicly broadcast, however, who is expected to listen and take action to address those lessons? Furthermore, are those who identified those lessons in a position to influence those who are in a position to implement change? The foreseeable truth is that no one, in the end, may have been delegated that responsibility, even after a lesson has been clearly identified. As time passes, interest in that particular disaster event as well as concern about its victims become overshadowed by more pressing issues and newly emergent hazards.

A preliminary review of case-specific lessons learned from a sixteen-country El Nino-related impacts assessment exposes the reality that many of those often costly lessons learned were really not learned in the true sense of the term. A multi-decade review that looks at previous disasters either in the same location or elsewhere would most likely uncover similar previously identified lessons. The point is that while some lessons are identified and applied – that is, truly learned – as a result of a given assessment, many of the directives derived from these costly lessons go unfunded or under-funded, which means that they are unused and eventually forgotten. They are rediscovered during reviews following the next similar disaster for which those lessons had already been identified. And so the cycle continues.

An assessment is urgently needed that focuses on identifying both the obvious and the hidden reasons why hazard- and disaster-related lessons are so often identified but so seldom learned, and end up gathering dust on library shelves.

ADAPTING TO AND MITIGATION OF CLIMATE CHANGE: “WHAT OUGHT TO BE” VERSUS “WHAT IS”

On paper, problems in the world are easy to solve. Planning activities to address them are quite thorough, often almost perfect. Numerous details are identified that must be attended to, and paths toward achieving the objectives laid out in those details are well-defined. That is what happens on paper. The impediment to this scenario is, of course, that the world does not exist only on paper, and problems in the real world often – always, really – arise when it comes to implementing the various aspects of these perfect paper plans. Plans (like scenarios) can be viewed as “what ought to take place” usually in a perfect world setting.

The reality is that in most cases these plans cannot be implemented as proposed, given the numerous potential constraints and hurdles – economic, political, social, cultural, infrastructural and bureaucratic – that must be overcome. Many examples can be cited of how the best laid plans for dealing with the impacts of a climate, water or weather disaster (drought-related food insecurity, hurricane impacts, the collapse of a fishery, an infectious disease outbreak) proved extraordinarily difficult to carry out effectively. The same problem applies to early warning systems: they work effectively if communication is timely and the targeting of at-risk populations is efficient, but neither effectiveness nor efficiency has ever been achieved at a perfect level in so imperfect a reality as the one in which these problems arise.

In theory, designing ways to enhance food security is also easy, but in practice many real constraints must be overcome to achieve the desired outcomes as described on paper. Looking at recent situations and the way they were responded to, and comparing them to a perfect response in the absence of constraints, provides an opportunity to identify the hidden bottlenecks that hinder the achievement of food security in the face of a variable and changing climate (Box 6).

BOX 6

RAMIFICATIONS

Ramifications refer to aspects of policy that, if neglected, would yield negative feedback to policymakers. The question that policymakers must ask is “what are the consequences of not doing this suggestion?”

- Every country needs to prioritize its hazards according to its own criteria, such as in terms of likelihood of occurrence and severity of impacts on citizens, infrastructures and ecosystems.
- The overriding objective for focusing on food security related to hotspots is to avoid creating new hotspots where they do not yet exist.
- Policymakers must not panic as they prepare for changes in the near and long term.
- Adaptation to change has to be appropriate to specific hazards or threats for a given period of time.
- There has been no attempt to systematically identify, region by region, which climate changes might be advantageous and which might be harmful.
- Decision makers must maintain a degree of flexibility in the implementation of their adaptation and mitigation strategies and tactics.
- Consideration must be made of how adaptation in one sector might affect the possibility for effective adaptation in another sector.
- Resist the pressure on decision makers to go for short-term benefits at the expense of long-term costs.
- Foster a cross-sectoral (multidisciplinary) approach that matches cross-sectoral aspects of and need for adaptation and mitigation. Such an approach will foster a broader, more appropriate approach to adaptive capacity building.
- Assure awareness and dissemination of conference and workshop proceedings about adaptation and mitigation to produce understanding and to reduce fear among both the general public and professionals.
- Policymakers must not only enhance agriculture’s mitigation role but must also reduce the vulnerability of poor and marginalized people to food insecurity.

WHY SOME SOLUTIONS TO ACHIEVING FOOD SECURITY ARE KNOWN BUT NOT APPLIED

The problems and prospects for a food-secure country can be made explicit by looking at three levels of analysis: individuals & groups, governments & agencies, and the international community. Into these categories, which are not mutually exclusive, might be added, at least at the individual level, human nature, such as, for example, the desire or need for short-term exploitation of land and water that overrides long term concerns about sustainability. In such a case, government leaders might choose to use fertile lands or deforest forested areas to produce cash crops such as biofuels or flowers; at the government level, bureaucratic units focus on their areas of concern with less regard for the impacts on the areas of concern off other bureaucratic units; at the international community level, food and feed are provided as trade and aid, the amounts of both being dependent on variable climate and market price factors. By looking at the food security and climate change issue according to these three levels of social organization, hidden obstacles to effective policy-making can be identified.

Effective national policy-making instruments and institutional arrangements are needed to override sole dependence on a sector by sector approach to enable the identification of crosscutting, downstream issues and impacts, including effective ways to address cross-sectoral issues, and long range time horizons that can strengthen local decision making mechanisms to ensure effective and rapid responses on the ground. A cross-cutting multi-sectoral approach can also serve to strengthen sectors and to foster a broader multidisciplinary perspective (FAO issues paper).

Most observers of the global food situation believe that enough food is produced around the globe to feed every person adequately, but transporting food and feed at low cost from surplus regions to food-deficit regions is expensive and is done usually only in times of an impending famine, not for situations categorized as chronic hunger.

One prior question (a question that precedes action) about coping with the impacts on food security related to climate change has become clear: Policy-makers must decide how they intend to organize in order to plan strategic responses. Are they going to rely on existing traditional

institutional arrangements, such as their existing sector-based governmental bureaucracies? Or are they going to seek new institutional arrangements to develop strategic and tactical plans for climate-, water- and weather-related global changes.

Another important point is that even if all human-induced greenhouse gas emissions could be stopped from entering the atmosphere today, the global climate will still continue to warm for much of the rest of the twenty-first century, because of the endurance of the various GHGs in the atmosphere. Again, there is no proverbial ‘silver bullet’ solution for controlling climate change or for coping with its impacts. Many solutions are yet to be identified.

KEY TAKE-HOME MESSAGES FROM THE FAO HIGH LEVEL CONFERENCE

In order to put agriculture, forestry, fisheries and food security on the international climate change agenda, the Food and Agriculture Organization of the United Nations (FAO), in cooperation with the Consultative Group on International Agricultural Research (CGIAR), the International Fund for Agricultural Development (IFAD) and the World Food Programme (WFP), organized a High-Level Conference on “World Food Security: The Challenges of Climate Change and Bioenergy” held at FAO Headquarters in Rome, Italy (June 2008). The conference brought together world leaders, policy makers and experts from many disciplines and discussed the challenges that climate change, bioenergy and soaring food prices pose to world food security. The major outcomes of the conference are: (i) Identification of the new challenges facing world food security, (ii) A better understanding of the nexus between food security, climate change and bioenergy, (iii) Discussion of required policies, strategies and programmes for ensuring world food security, in particular measures to address soaring food prices and (iv) A declaration on “World Food Security and required actions.”

The following list highlights some of the summary of typology of management and policy options relevant to country level actions synthesized based on the discussions during the FAO’s expert meetings that preceded the high level conference:

Climate change adaptation and mitigation

- Adaptation measures need to focus on
 - climate change “hot spots” analysis,
 - early warning systems,
 - disaster risk management,
 - rural investments: crop insurance, incentives to adopt better agricultural and land use practices,
 - building capacity and awareness on climate change adaptation,
 - extension and research services at national level - data collection, monitoring, analysis and dissemination,
 - Soil Carbon Sequestration – potential option for mitigation in agriculture.

Climate change, water and food security

- Integration of adaptation and mitigation measures for agricultural water, management in national development plans,
- Technical and management measures to improve the water use efficiency in rainfed and irrigated agriculture,
- Knowledge on climate change and water, and share good practices among countries and regions,
- Risk management in national policies through better monitoring networks,
- Adaptation funds to meet the challenges of water and food security under climate change.

Climate change and disaster risk management

- Better understanding of climate change impacts at local level,
- Diversifying livelihoods and adapting agricultural, fishing and forestry practices,
- Improving and expanding weather and climate forecasting and early warning systems,
- Contingency plans and disaster risk management plans in agriculture taking into consideration new and evolving risk scenarios,
- Adjustment of land use plans,
- Cost/benefit analysis on structural mitigation measures.

Climate-related transboundary pests and diseases:

- Strengthening national animal and plant health services,
- Focusing on basic sciences - taxonomy, modelling, population ecology and epidemiology,
- Consolidating and organizing national animal and plant health services,
- Investment in early control and detection systems, including broader inspections,

Climate change, fisheries and aquaculture:

- Adaptation strategies based on ecosystem approach,
- Understanding and anticipating ecological change and developing appropriate management responses.

Climate change, biofuels and land,

- Sound land tenure policies and planning,
- Greater land tenure security to mitigate climate change,
- Enabling and encouraging investments in sustainable land use practices.

Bioenergy and food security

- Ensuring that bioenergy is developed sustainably,
- Safeguarding food security and ensuring that benefits include market and technology promotion and encouraging participatory processes.

Climate change and biodiversity

- Assessment of distribution of biodiversity for food and agriculture both in the wild and in the fields,
- Assess its vulnerability to climate change,
- Biodiversity distribution mapping with different climate change scenarios.

Following significant discussion and negotiations, the conference concluded with the adoption by acclamation of a declaration calling on the international community to increase assistance for developing countries, in particular the least developed countries and those that are most negatively affected by high food prices. The declaration reads:

“There is an urgent need to help developing countries and countries in transition expand agriculture and food production, and to increase investment in agriculture, agribusiness and rural development, from both public and private sources,” according to the declaration and noted that “It is essential to address the fundamental question of how to increase the resilience of present food production systems to challenges posed by climate change.”

On climate change, the conference urged governments to assign appropriate priority to the agriculture, forestry and fisheries sectors, in order to create opportunities for the world’s smallholder farmers and fishers, including indigenous people, in particular vulnerable areas, to participate in, and benefit from financial mechanisms and investment flows to support climate change adaptation, mitigation and technology development, transfer and dissemination.

On the issue of biofuels, the conference concluded that it is essential to address the challenges and opportunities posed by biofuels, in view of the world’s food security, energy and sustainable development needs. The members are convinced that in-depth studies are necessary to ensure that production and use of biofuels is sustainable and take into account the need to achieve and maintain global food security. The conference called upon relevant inter-governmental organizations, national governments, partnerships, the private sector, and civil society, to foster a coherent, effective and results-oriented international dialogue on biofuels in the context of food security and sustainable development needs.

A “REALITY CHECK”

“Nature can look after the needs of people. It cannot look after the greeds of people.” (Gandhi)

Some topics are more or less treated as “taboo” when discussing food security issues, such as corruption, politics, the notion of “the greatest good for the greatest number,” hidden subsidies, ethnic rivalries, greed, and population as an environmental issue. Numerous examples can be cited of how each of these topics has affected food security and the environment in countries around the world: During the Sahelian drought in the early 1970s, some West African countries continued to export cash crops while their citizens were perishing from starvation in a famine that resulted from severe, drought-related food shortages. As another example, large swaths

of the Brazilian rainforest have been deforested by people fleeing drought in the Brazilian *Nordeste* in order to grow crops on lands that have soils known to be fragile for sustainable cultivation. In Indonesia, rainforest has been “torched” on purpose by then-corrupt government officials in order to develop illegal oil palm plantations on previously protected land, and in the United States, land has been taken out of production (put into a ‘land bank’) in order to control the price of grain in the marketplace. Finally, productive land has been converted to golf courses in Japan. And the list goes on and on.

Because every government has financial constraints, each has to make decisions involving trade-offs between costs and benefits. In tradeoffs between providing food security for 100 percent of a population and attempting to increase foreign exchange earnings, for example, the latter usually takes precedence because exchange earnings have been valued more highly than full nutritional capacity. Other trade-offs emerge, as questions policy-makers must negotiate answers to: Are city dwellers favored over rural inhabitants? Should Mangroves receive protection over shrimp farms? Is wheat a priority over teff, sorghum or millet? How are questions such as these to be answered?

An issue that generates much discussion but is nonetheless still considered taboo is population. The fact is that climate change will impact the availability of and access to adequate food and nutrition for most if not all people on the globe. Given increasing population numbers coupled with economic development prospects and growing demands of the affluent for food and fuel, food insecurity can be expected to increase under a “business as usual” scenario. Effective adaptation strategies can alleviate food insecurity *if* the “will” to do so exists at the international community level. “Ways” to cope effectively are either known or are likely to be soon developed, as food security becomes increasingly threatened by global warming. Population management has also been proposed by China as a “carbon sink” for which it could seek carbon credits. It noted that its one child per family policy has reduced the country’s carbon emissions by the amount that the unborn populations would have produced over the course of their lifetimes. Many people disagree with such an approach in the name of protecting the environment.

In the end, policy-makers everywhere have always had to cope with many different and urgent issues involving competing interests for which they have to make decisions, often with incomplete information. How to mitigate and adapt to global warming is the latest such issue with which they have to deal.



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INDIGENOUS PEOPLE IN ANDEAN MOUNTAINS

Indigenous peoples are among the first to suffer from increasingly harsh and erratic weather conditions, and a generalized lack of empowerment to claim goods and services to which other population groups have greater access.